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FRONT COVER

An Arab Moving His Grain Sorghum by Camel Back, Saudi Arabia

Combining the old and the new, this load of grain sorghum, grown with modern machinery and scientific farming methods, is carried on the back of Saudi Arabia's age-old means of transportation, the camel. (Photo courtesy of Arabian American Oil Company.)

BACK COVER

Map of the Middle East

Today's map of the Middle East closely resembles its ancient counterpart used by Phoenician seamen. Many countries have changed their boundaries and a few have changed their names. Persia has become Iran. Iraq has replaced Mesopotamia. The land of the Hittites has become only a small section of modern Turkey. But Beirut still handles shipping on the Mediterranean. Egypt survived as a country after Thebes, seat of the Pharaohs, was superseded by the modern capital of Cairo. Many historical towns of the Middle East still stand—Baghdad, Jerusalem, Damascus. And the ageless Tigris and Euphrates Rivers continue to wind their way to the Persian Gulf, joining at the port of Basra.

Credit for photos is given as follows: p. 195, Oriental Institute, University of Chicago; p. 197, Press Attaché, Turkish Government; pp. 198-201, Charles R. Enlow; pp. 202, 204, Henry Jones; p. 205, Trans World Airline; p. 208, United Nations (top), Afif I. Tannous (bottom, left), Fraser Wilkins (bottom, right); p. 209, Arabian American Oil Company (top, left), Embassy of Iraq (bottom, left), Soil Conservation Service (right).

THE MIDDLE EAST ISSUE

Periodically, an issue of FOREIGN AGRICULTURE will be devoted to the agricultural problems of the various geographic regions of the world.

This September issue, the first in the series, is a discussion of agriculture in the Middle East—some of its needs, problems, potentialities, and the solutions that are under way.

Citizens of the western world know relatively little about the Middle East, but increasingly the subject is becoming of interest to students and laymen alike.

In studying the region it will be seen that the overall basic problem is that of raising levels of living. The solution, however, takes a special form in each of the countries.

Egypt: How can enough land be put into production to feed and support its rapidly growing population?

Iran: How can available water resources be developed and properly used for increased production?

Iraq: How can floods be controlled and the water stored for irrigating vast areas of potentially rich farm land?

Israel: How can the water resources be developed for the expansion of the country's agricultural economy?

Kingdom of Jordan: How can the Jordan Valley be most effectively developed?

Lebanon: How can the water resources be efficiently used for expanding irrigation and creating power for industry?

Saudi Arabia: How can land be developed for settling nomadic tribes?

Syria: How can the problem of land tenure be solved and the country's great agricultural potential realized by independent landowners and farmers?

Turkey: How can the farm population be trained to use most effectively the extensive agricultural resources of the country?

Space limitations prevent publishing in this issue an article on each of these nine countries. We have chosen, therefore, to discuss the agricultural situations of Egypt, Iran, and Turkey as being fairly representative.

FOREIGN AGRICULTURE **ALICE I. FRAY, EDITOR**

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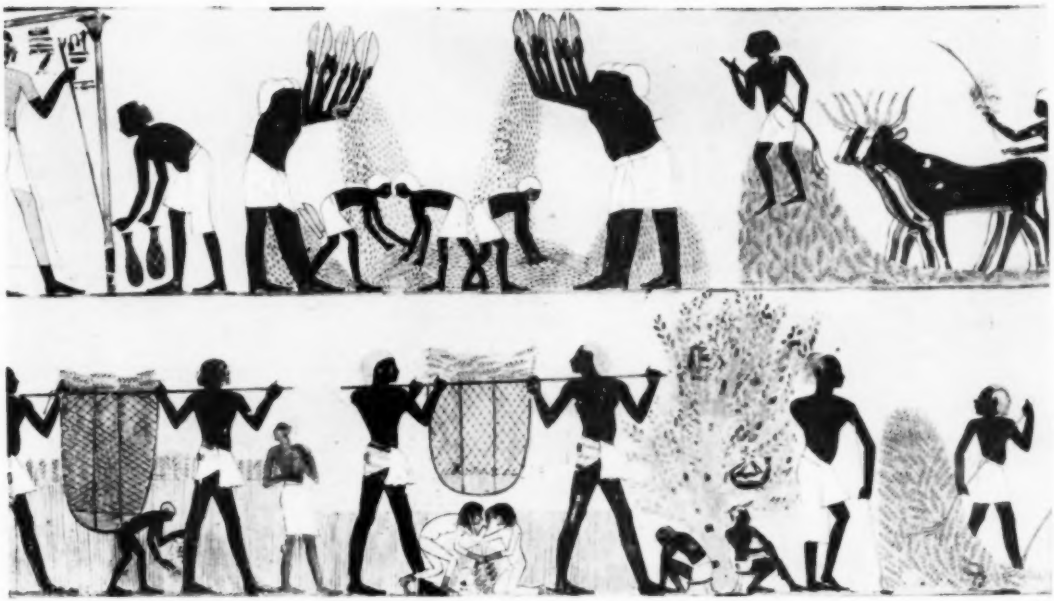

MAPS OF PHOENICIAN SEAMEN showed the civilized world stretching from the Nile Valley up the Syrian coast to the steppes of Asia Minor and the tip of Macedonia. Eastward it crossed Arabia to the farthest reaches of the Persian empire in distant Cashmir. According to history, this Middle Eastern world was to contribute more to modern civilization than any other area in any other time.

Many racial groups had mingled here since the earliest nomadic tribes settled in the fertile valley between the Tigris and Euphrates Rivers to till the land and evolve a civilized culture. As one group conquered another for control of the region, each left a rich cultural heritage for the civilization that replaced it. Persian astronomers began an inquiry of the heavens, and Egyptian engineers raised the pyramids. Sculptors ringed the temples of Assyria with stone friezes to leave a perpetual history of the people and their religion. Sumerian mathematicians calculated the system of telling time by minutes and hours. The cuneiform script of Babylonia was laying the foundation for the modern alphabet. And Hebrew scholars were writing down the ancient vocal prophesies of the children of Israel.

At the base of these civilizations was the farmer, who worked the land and depended upon it for his food and clothing. His life and his religion were bound by the soil, and to insure prosperity he made libations to the gods of fertility and observed the rites of spring. His lands prospered and his husbandry developed wheat, barley, oats, cotton, and alfalfa. Choice fruits—nuts, figs, olives, and dates—originated in his orchards. He bred swift Arabian horses and camels and fine sheep. He cultivated rare oranges from the Orient that were introduced through him to the western world. He used methods of cultivation that have survived the centuries.

From their home port of Beirut, Phoenician ships handled the commerce of the world, carrying the cedar of Lebanon and the spices of Arabia to the Greek city-states and sailing west to the edge of the Mediterranean for tin from the mines of Spain. Oils and wines from Israel were sold in the marketplaces of Tyre and Egyptian produce found buyers in Carthage.

Two thousand years have altered this world. Erosion, dust storms, and constant cultivation swept away rich topsoil and robbed the land of its fertility. As agricultural productivity waned, the centers of trade moved westward to Europe. The Middle East slipped gradually into decline.

Today the Middle East is planning a new page in its ancient history that may read like those of early days. To better living conditions of its people and restore its trade with other nations, it is seeking to regain its lost abundance. In this land that once prospered, there is hope and determination for renaissance.

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Turkey—An Expanding Agricultural Economy

Turkey, gateway to the Middle East, is promoting rural education, tax reduction, modern machinery, and crop improvement to encourage higher farm production.

by **C. S. STEPHANIDES**

Turkey, with an estimated population of 19,000,000 and with an area of nearly 193 million acres, is among the most thinly populated of the Middle East countries. Of the total cultivable area, estimated at 73 percent of the total area, less than 20 percent is in field or tree crops and the rest is in pasture. About one-third of the cropland is in fallow each year. The fallow period ranges from 2 to 4 years. The possibilities of increasing the crop area are therefore great.

In general the Turkish farm consists of communal and private land. The communal land, usually grazing meadows and forests, can be used by all members of the village. The arable land, on the other hand, is private property. Small farms predominate. About 97 percent of all farms comprise 125 acres or less. The medium-sized units, between 125 and 1,250 acres, account for only 2.3 percent of the total. There are only 418 large farms, averaging 3,750 acres, which are largely operated by tenants or sharecroppers.

Despite appreciable advances in establishing industry, the Turkish economy is still predominantly agricultural. More than 80 percent of the population is engaged in farming. In the Black Sea coastal area and in central Anatolia, more than 90 percent of the population is rural.

The establishment of the Republic in Turkey in 1923 was an important landmark in its agricultural development. Before that time, the vast Anatolian Plateau, potentially rich farm land, was inhabited mainly by roaming seminomadic people whose major occupation was livestock grazing. Under such a system the production of bread grains was insufficient for the needs of the country, and substantial amounts, especially of wheat, were imported. The new Government adopted an agricultural program to encourage production. Through this program, production has been increased to the point where Turkey is now practically self-sufficient, and exportable supplies have risen until they make up from 80 to 90 percent of the value of all exports.

The aim of most Turkish farmers is to produce enough crops and raise enough livestock for their family needs and a little surplus for sale or exchange for the things they cannot raise or make. Thus, their marketable produce is relatively small. The farm family diet is mainly bread grains and vegetables. Meat and fats, either of animal or plant origin, are not so abundant and are eaten sparingly by the farming people.

Through its good climate and soils, the interest of its Government, and especially the sturdiness of its farming population, Turkey has achieved striking increases in agricultural production, as shown by the following figures. Comparing the average 1927–29 production of crops and the number of animals with those of 1942–44 reveals the following increases in terms of percentages: Wheat 92, barley 62, corn 91, rye 102, rice 107, oats 177, legumes 70, sugar beets 1,073, cotton 203, sheep 70, common goats 12, angora goats 20, cows 56, water buffaloes 33, camels 24, horses 61, mules 103, and donkeys 45. To a great extent, these are actual increases in crop production and livestock numbers effected by helpful Government measures. To some extent, however, they are believed to be the result of improved crop and livestock reporting techniques. With the abolition of the tithe and the reduction of other taxes on agriculture, farmers had more faith in the Government and their reporting to Government representatives was more accurate.

Crop Production and Trade

Wheat has been the most important crop both in acreage and value in the Turkish economy. The most

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vigorous research has been in this field. Several experiment and seed-producing stations have been established to obtain better-adapted varieties and provide farmers with improved seed. Wheat occupies about 50 percent of the cereal area, which in turn accounts for about 90 percent of the total land in crops.

Bread grains, and especially wheat, occupy the most prominent place in the diet. For the vast majority of people, bread (ekmek) is the basic part of every meal, while meats, dairy products, fruits, or vegetables serve as relishes. This is further proved by the yearly per capita consumption of bread grains, excluding rice, which is conservatively estimated at 558 pounds.

In addition to grains, Turkey is also more than self-supporting in the other major agricultural foodstuffs and in tobacco and partly in wool, timber, and leather. Furthermore, it has surpluses of many agricultural products—small amounts for some grains and cotton and large quantities of such products as tobacco, raisins, filberts, figs, legumes, and opium. Turkey imports coffee, tea, dates, some lemons, fine wool, and finished cotton products. Only a few years ago, Turkey imported all its sugar and tea. With the establishment of sugar factories and the expansion of sugar beet cultivation the country has almost become self-sufficient in this important product. Tea production, too, has grown in recent years and now meets part of the needs of the country.

Among the Oriental-tobacco-producing countries, Turkey now ranks first, with production roughly about 50 percent above the prewar average. Tobacco holds first place among the exports of the country, and, for many years before World War II, it accounted for about 50 percent of the total value of all exports. Tobacco production, sales, storage, manufacture, and price are regulated by the State Monopoly, similar to those of Western Europe.

TABLE 1.—*Summary of crop area, production, trade, and domestic utilization of agricultural products in Turkey, 1935–39 average and 1945–47* [1]

Commodity	Area		Production		Net trade [2]		Available for domestic consumption [3]	
	1935–39	1945–47	1935–39	1945–47	1935–39	1945–47	1935–39	1945–47
	1,000 acres	*1,000 acres*	*1,000 short tons*	*1,000 short tons*	*1,000 short tons*	*1,000 short tons*	*1,000 short tons*	*1,000 short tons*
Wheat	8,928	9,385	4,090	3,649	−73	−77	4,017	3,572
Barley	4,571	4,201	2,272	1,497	−84	−62	2,188	1,435
Corn	1,109	1,310	647	521	−18	+6	629	527
Rye	939	1,006	407	424	−20	−37	387	387
Millet	133	166	50	62			50	62
Oats	618	662	273	194			273	194
Spelt	274	225	101	82			101	82
Mixed grain	316	497	119	187			119	187
Rice	74	49	65	45			65	45
Potatoes	136	138	200	287			200	287
Sugar			80	109	+31	(4)	111	(4)
Sugar beets	69	111	476	660			476	660
Onions	82	99	108	116			108	116
Lentils	77	101	25	29			25	29
Navy beans	168	208	54	64			54	64
Kidney beans	17	12	4	3			4	3
Broad beans	168	82	78	20			78	20
Chickpeas	173	183	60	67			60	67
Sesame	161	116	32	28			32	28
Olives			262	211			262	211
English walnuts			68	56	−7	−1	61	55
Almonds			15	11	−2	−1	13	10
Filberts			74	62	−54	−33	20	29
Pistachios			8	7	−1	−1	7	1
Chestnuts			15	14			15	14
Raisins			74	56	−65	(4)	9	(4)
Figs, fresh			149	[5] 136	[5] −35	−17	8	69
Grapes			1,100	1,587			1,100	1,587
Plums			57	55			57	55
Apples			119	97			119	97
Apricots, wild			52	21			52	21
Apricots			19	11			19	11
Pears			89	78			89	78
Quinces			34	23			34	23
Mulberries			53	54			53	54
Cherries			25	22			25	22
Cherries, sour			11	12			11	12
Cherries, Cornelian			9	12			9	12
Peaches			10	10			10	10
Prunes			3	1			3	1
Carobe			8	(4)			8	(4)
Jujube			6	(4)			6	(4)
Oranges			32	25	−2		30	25
Oranges, Seville			2	1			2	1
Tangerines			3	2			3	2
Lemons			2	10			2	10
Cotton, ginned	662	561	66	53	−19		47	53
Opium	72	62	[6] 623	[6] 385				
Tobacco	195	289	68	98	−40	−40	28	58
Flax fiber	47	52	3	2			3	2
Flaxseed	47	52	11	11			11	11
Hemp fiber	30	27	9	12			9	12
Hemp seed	30	27	2	3			2	3

[1] Official Turkish Government statistics, except for 1946 and 1947, which are estimates of the Office of Foreign Agricultural Relations.
[2] Exports, −; imports, +.
[3] Preliminary.
[4] Not available.
[5] Dried figs. The equivalent, in terms of fresh figs, is 141,000 short tons for 1935–39 average and 67,000 short tons for 1945–47.
[6] In thousand pounds.

Machinery is being used increasingly on Turkish farms.

Filberts are second in importance to tobacco as an export item. Turkey is the largest filbert producer in the world, with 52 percent of the production, and the varieties and quality of its crop are considered among the best. Since World War I the production of filberts has been increasing, and the improvements in grading, storing, and marketing have largely been done by Government-organized cooperatives.

With the organization of the raisin growers association and the setting up of grades and standards for harvesting and handling, the raisin industry has increased in value and volume, and exports also have increased. The export value of raisins often competes for second place with filberts. Turkish raisins, because of their quality, command a good price in the world market.

Other agricultural exports of Turkey are, in order of importance, grains, legumes, cotton, and dried figs. Grains have become increasingly important as a commodity for export since 1935, while before World War I, Turkey used to import part of its bread grains. As more machinery is made available, more cultivable land will be planted to cereals. With the improvement of transportation and storage facilities, the cereal export market could become more important.

Since the beginning of the Republic, Turkey has given more attention to irrigation and drainage and to the introduction and expansion of crops that used to be imported. The acreage of both cotton and sugarcane have increased and cultivation practices have improved. Sugar beet production is increasing so rapidly that Turkey may in the near future become an important exporter. The native varieties of cotton have now been largely replaced with the American Acala, which the country proposes to make its standard single variety. This, with price supports and other facilities that are provided to farmers, such as good seed, grading, and marketing, points to a substantial increase in the production of this commodity.

In view of the fact that for many years the Turks have been mainly a pastoral people and that the cultivation of many varieties of crops is rather recent, there is plenty of ground both for introducing new crops as well as for expanding those already cultivated. The increased production of sugar beets is an indication of what might happen with such other new crops as soybeans, tea, and bananas, which are already gaining in importance.

Livestock

Livestock always has been important in the agriculture of Turkey. In the past, it was the important source of Government revenue. Since the establishment of the Republic, when part of the heavy taxes on livestock were abolished, livestock numbers have increased. The extensive pasture areas, which make

Locally made conveyor-type irrigation outfit distributed by Turkey's Sugar Factories to villagers at Alpullu.

TABLE 2.—*Livestock numbers and the production of livestock products in Turkey, 1935–39 and 1940–44 averages* [1]

Animal or commodity	Numbers or production	
	1935–39	1940–44
Livestock:	*1,000 head*	*1,000 head*
Sheep	20,889	23,641
Common goats	10,550	11,691
Angora goats	4,567	5,003
Cattle	8,477	9,644
Water buffaloes	835	900
Camels	112	109
Horses	945	983
Mules	72	84
Donkeys	1,459	1,635
Chickens	17,316	17,904
Turkeys	1,015	1,240
Livestock products:	*1,000 short tons*	*1,000 short tons*
Cow's milk	1,140	1,274
Sheep's milk	670	736
Common goat milk	572	636
Buffalo milk	364	392
Angora goat milk	35	39
Eggs	65	60
Honey	6	[2] 4
Wool	31	34
Angora mohair	8	9
Goat hair	7	8
Buffalo hides	[3] 26	51
Raw cocoons	2	3

[1] Official Turkish Government statistics.
[2] 4-year average, 1940–43.
[3] 1936–39 average.

The new Turkey is giving its farm youth an opportunity for an education.

up 50 percent of the total land area, could accommodate much more livestock than at present.

Although the livestock industry in Turkey is considered primitive, it still provides the Turkish farmer with draft power, transportation facilities, milk and meat for food, mohair and wool for clothing, and skins and hides for various uses. After satisfying the requirements of the country, this industry provides considerable numbers of live animals and substantial amounts of wool, mohair, hides and skins, and butter and cheese for export.

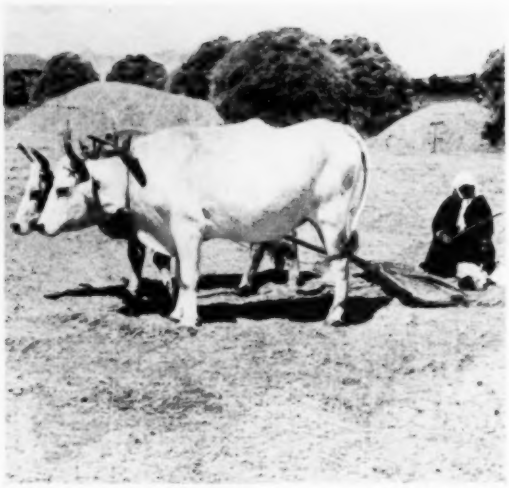
Marketing methods are primitive and wasteful. The animals are driven long distances to market or to export ports, and actual losses in weight enroute are substantial. Handling facilities at the ports and abattoirs are meager. There are no modern slaughterhouses and no freezing units where carcasses can be stored and marketed as needed. Meat is thus consumed fresh.

Some attempts have been made to establish meat-canning and dairy factories. If they could be established in sufficient numbers in certain livestock regions, the export of meat, butter, and cheese would increase. Such establishments will provide marketing facilities that will induce farmers to improve their livestock through breeding, better feeding, and in general through better care and management.

Veterinary service is inadequate and losses of livestock are substantial. The present facilities for training veterinary personnel are inadequate, and it will be many years before the country can train sufficient numbers of technicians to meet the needs. Losses due to poor sheltering and starvation during severe winters have also been great.

The new Republic greatly appreciates the economic importance of livestock, and for this reason several livestock stations have been established where breeding and feeding experiments are conducted. With the improvement of marketing facilities the livestock industry in Turkey has great possibilities for becoming an important economic asset.

Since time immemorial the sheep industry has been important in the country. This is partly due to extensive pastures and to the nomadic type of agriculture that prevailed among the Turks. Sheep are the most numerous, and sheep husbandry is one of the leading livestock industries of the country. Most farmers keep sheep for milk, meat, and wool. Most of the cheese in the country is made from sheep's milk. Although the native sheep are good milkers, they are poor meat and wool producers. The wool is mostly coarse, not suitable for the fine textile industry. It is excellent for the making of carpets, an important industry in Turkey. The Government, to improve the quality of wool and also the meat production, has introduced merino sheep, which are crossed with the native. A special livestock station has been established



Despite increasing mechanization, most of Turkey's wheat is still threshed with threshing sleds.

from which many hundreds of merino breeding animals have been distributed to farmers. Turkey is a large wool producer.

Goats—the common type and the famous Angora—are next in importance to sheep. Common goats are scattered in many sections of the country and are raised essentially for milk and meat. For many years before 1923 the Angora goat, famous for its mohair, was neglected and lost much of its importance in the Turkish economy. Lately, its numbers have been increasing, and today Turkey is second only to the United States as a producer of mohair.

Cattle are raised principally as work animals, and milk and meat are secondary in importance. There are no special dairy or beef breeds. Since 1925, some attempts have been made to introduce dairy-type cattle into the northwestern part of the country where better grazing lands are found. The principal draft power in the country is still the ox and the water buffalo. Under the prevailing system of land ownership and of agricultural practices, cattle will continue to provide draft power since it is the cheapest source under the present conditions. Mules and horses are seldom used for draft purposes on the farm. They serve mostly as pack and transportation animals. Most of them are used by the army. Only the well-to-do farmers can afford to have horses. Owning a horse is associated with a high social and economic status.

Poultry is plentiful in Turkey but the industry is not specialized. Every farmer raises a few chickens, the number varying from 10 to 25, depending on the region. Farmers consider poultry products luxury food. Despite adverse conditions of storage and transportation, large numbers of eggs are exported annually. No systematic work in breeding and feeding or in selection is done. The native breeds are mixtures of many kinds that were brought into Turkey in ancient times by settlers and invaders.

Postwar Changes in Foreign Agricultural Trade

The most important developments in Turkish foreign trade before World War II were the general increase in exports and decrease in imports of agricultural products, the rise of Germany as the principal market for Turkish products, and the transition of Turkey from a wheat-importing to a wheat-exporting nation. Other purchasers of Turkish products were, in order of importance, the United States, Italy, the United Kingdom, and France. These five countries normally absorbed about 63 percent of Turkish exports, and in 1938 they took more than 70 percent of the total, half of which went to Germany.

Since the war with the loss of the German markets, new markets have been hard to find for the kinds of agricultural products that Turkey exports. Postwar Europe needed more bread grains and less of such relatively luxury products as tobacco, raisins, figs, and filberts, which make up the bulk of Turkish exports. Turkey then had to find new outlets. Thus several trade agreements were signed with Sweden, Denmark, Poland, Finland, France and the French Zone of Germany, Czechoslovakia, Greece, Great Britain, and Switzerland. Turkey has continued normal trade relationships with its Middle East neighbors even during the Arab-Jewish conflict.

Since the war, the United States has held first place (by value) as importer of Turkey's agricultural products. England has been a close second, with Italy steadily increasing in importance.

Government Programs for Agriculture

Governmental aid to farmers has taken several forms, including abolishing the tithe and reducing direct taxes, granting credits through the State Agricultural Bank at low rates of interest, and development of agricultural cooperatives. The organization of agricultural cooperatives has protected farmers from unscrupulous exploitation and has aided in the grading, standardizing, and marketing of farm products.

Turkey also has several agricultural schools—the College of Agriculture in Ankara, four junior agricultural colleges, and several small practical agricultural schools, which have been established in various parts of the country to help farmers with modern production methods.

Since 1935 the Government has been concerned with supplying landless farmers and small landowners with a reasonable amount of land. A special law was passed in June 1945, establishing in the Ministry of Agriculture the Land Reform Department, which has already begun work on the distribution of land acquired from the State or from large landowners.

During World War II, 13 large farms were established in different sections of the country to increase the production of bread grains by the large-scale use of heavy agricultural machinery. Since the war, they have been transformed into centers for training farm youth in the operation, maintenance, and proper use of farm machinery and for large-scale production of good seed, livestock, and fruit trees.

The Toprak Office (Office of Products of the Soil), established in July 1938, was instrumental not only in maintaining adequate stocks of domestic cereals and pulses but also in preventing sharp price fluctuations in those commodities. It achieved this by controlling exports and by purchasing directly from the producer. As a result of the concentration of large amounts of grain in the hands of the Toprak Office, the erection of grain elevators was made possible. At present these storage facilities, large and small, have a total capacity of about 560,000 short tons.

The Agricultural Supplies, Machinery and Implements Office established in the Ministry of Agriculture was charged with the responsibility of manufacturing all kinds of farm tools, machinery, transportation materials, pesticides and veterinary tools, and chemical fertilizers, of obtaining seeds, breeding horses, and draft animals from domestic and foreign markets and selling them to farmers on cash or installment basis. It was also designated as the Government's official purchasing agent for agricultural supplies, farm machinery, and implements.

The Turkish Tobacco Monopoly is another Government agency that controls prices in order to maintain a standard of returns to the producer and acquire maximum foreign exchange. It and other Government-supported organizations enter the tobacco market, when necessary, to support sagging prices.

The above-mentioned Government agencies have been instrumental in improving agricultural production and in controlling prices through buying, storing, grading, packing, and marketing.

Since the coming of the Republic the Turkish peasant has been made to feel that he, too, is a part of the Republic and that he has the right to share in the educational facilities. Farm youth for the first time in the history of the country have had a chance to attend schools and take active part in the affairs of the state. With this and with ever-expanding facilities for producing more and better crops and livestock, reforms in land distribution and taxes, the cooperatives, and farm credit, the standard of living of the Turkish peasant will continue to improve.

At a collection center, Turkey's Office of Products of the Soil buys cereals.

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Egypt—Ancient and Agrarian

Increased food production in the Nile Valley—since antiquity a granary of the Middle East—would help raise levels of living of an expanding population.

by **AFIF I. TANNOUS**

Since the dawn of human history, agriculture has played the leading role in the development of Egypt. It has been mainly responsible not only for the country's growth into a center of world culture in ancient times but also for its transition into a national entity in modern times. At present, agricultural activity is the wide and solid base on which the national economy of the country stands. It accounts for a major portion of the national income and for the greater portion of the total value of all exports. Some 80 percent of the population is dependent upon agriculture for a living. These consist mostly of the *fellahin* groups—the cultivators of the soil.

Physical Features

Quite appropriately, Egypt has been called the Valley of the Nile. Its life—plant, animal, and human—depends almost entirely upon the waters of that river and upon the extremely fertile soil it has built up in its extensive delta over countless centuries. Rain is limited to a few inches a year in the coastal zone, but sunshine is plentiful, and the growing season is a year long. Under the influence of these favorable factors, an abundant agriculture has been developed. By means of intensive irrigation, the soil has been made to produce on the average one crop and a half a year.

In the source regions of the Nile, in the heart of Africa, a regular yearly flood takes place, which reaches Egypt toward the end of July and continues throughout August and September. This annual flooding of the land has given rise to the historical crop season of Egypt, known as the *Nili* (the Nile or flood season), extending into late fall. By the development of perennial irrigation, two other crop seasons have been added, the *Shitwi* (winter season), extending from October to June, and the *Seifi* (summer season), extending from February to September.

Topography is not an important factor in the agriculture of Egypt. The cultivated land lies mainly in the delta of the Nile, fanning out from Cairo northward. Between Cairo and the southern frontier, the river runs through a relatively narrow valley, which permits cultivation within an average width of 6 miles.

As a result of this uniformity in its basic physical features, Egypt possesses in reality but one agricultural region. Some differentiation occurs, however, on the basis of such factors as time of planting and harvesting, specialization in certain crops, and extent of perennial as compared with flood irrigation. Thus it has become customary to differentiate the country into Lower and Upper Egypt. The former consists of the Delta proper, from Cairo northward. Here lies most of the cultivated land, and here is produced the bulk of such leading crops as cotton, corn,

wheat, barley, clover, and rice. Perennial irrigation is the rule. In Upper Egypt, which consists of the rather narrow Nile Valley between Cairo and the southern frontier, flood irrigation is still practiced. Here the leading crops are grain sorghum, horse beans, sugarcane, and onions.

Land Utilization

Intensive utilization of land, wherever irrigation could be extended, is an outstanding feature of Egyptian agriculture. Thus the total cultivated area of some 6 million acres is equivalent to 9 million crop acres. On the other hand, it must be remembered that this agricultural area does not exceed 2.4 percent of the country's total area of 600,000 square miles. Furthermore, it has been ascertained that not more than 1.5 to 2.5 million acres could be added to the cultivated area. Of course, this does not take into account long-range plans for land development through large-scale control projects along the upper portions of the Nile in the heart of Africa.

Consequently, population pressure on the land is one of the highest in the world, as is indicated by a ratio of 3.1 persons to the cultivated acre. This pressure has been increasing appreciably from year to year.

One can best understand the over-all pattern of land utilization in Egypt by focusing attention on cotton as the basic figure in that pattern. From 16 to 20 percent of the crop area is allotted to this cash export crop. Bread grains, the staple food of the masses of cultivators who produce the cotton, are grown extensively, as is clover, the main feed crop. Orchards are limited.

Another basic factor in land utilization is the system of land tenure. Here we observe two major features or issues—the predominance of too small farms, of about 2.5 acres each, in the hands of the majority of small cultivators and the concentration of ownership in the hands of the few. In order to provide a reasonable basic standard of living for a *fellah's* family, it is considered that the average farm should be not less than 4 to 5 acres.

Large estates, which account for more than 37 percent of all agricultural land, are held by 0.5 percent of all landowners. These estates are normally cultivated by the landless or the small-farm *fellahin*, who constitute about 75 percent of all farmers.

Production Techniques

Agricultural production practices in Egypt are a peculiar combination of the ancient and the modern. The hand sickle, the threshing board, the wooden plow, the *shadoof* (the ancient pole-and-bucket method of irrigation), and the water wheel drawn by animals exist side by side with great engineering works for irrigation, the disk plow, the tractor, and the combine. Ignorance by the peasants of the principles of plant and animal breeding, and of pest and disease control, stands in striking contrast to a number of up-to-date Government projects in these fields.

Taking into consideration all aspects of Egyptian agricultural activity, one cannot but conclude that it rests fundamentally upon the *fellah* with the hoe. It is an agricultural economy that flourishes primarily upon manual labor, which is abundant and cheap. Is the system efficient? The answer depends upon one's viewpoint. The yield per acre is extremely high, whereas production per individual is extremely low.

Because of the abundant cheap labor and the predominance of extremely small farm units, the use of modern farm machinery has been restricted. For example, the total number of tractors currently in operation is estimated at 3,500 for 9,000,000 acres of cropland, compared with 3,250,000 for the United States 403,000,000 acres of cropland. Other items of heavy machinery are similarly limited in number and importance.

Nitrogenous fertilizer, all of which is imported, is a most important item, needed to maintain soil fertility under the prevailing system of intensive cultivation. Before World War II, Egypt imported about 550,000 tons of this commodity annually, mostly from Chile, Germany, and Norway. With the expansion of perennial irrigation, making possible more intensive cultivation, import requirements have increased to some 770,000 tons. If the recently launched project of raising the great Aswan Dam for irrigation and for the generation of hydroelectric power proceeds according to plan, in a few years Egypt will be able to manufacture its own nitrogenous fertilizer.

On the other hand, Egypt is rich in rock phosphate, having an exportable surplus of some 330,000 tons annually.

Major Crops and Livestock

Cotton rules supreme in the agriculture and in the total economy of Egypt. It is the cash crop par excellence, the crop that has given Egypt an important place in world markets and provided it with the neces-

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sary exchange for the importation of industrial products. All other crops and livestock are accorded a secondary role, mostly as a means for attaining the main objective—the production of high-quality exportable cotton. Normally, this crop occupies about 20 percent of the total crop area.

Corn and wheat are the two most important bread grains, corn being the staple diet of the *fellahin,* and wheat being consumed mostly in urban centers. The Egyption Arabic word for bread is *'aish* signifying life or living. It is indeed the symbol of life, the cornerstone of security among the great masses of the population. The two other bread grains are barley and grain sorghum. In normal times, these are used mostly for feed.

In prewar years, Egypt was self-sufficient in bread grains. In recent years, its need for imports of these items, especially wheat, has been increasing. The main factor responsible for this is the rapid rate at which the population has been increasing. At the present rate of consumption, Egypt needs to import some 550,000 tons annually.

Rice is another major grain crop, which has been expanded rapidly in recent years. Egypt is now in a position to export about 220,000 to 440,000 tons of cleaned rice annually. This expansion has been due to the fact that rice yields much more per acre than wheat and commands higher prices in world markets.

Wheat breeding experiments, Fouad I. University, Giza. Egypt is outstanding in applying science to agriculture.

The significance of grain in Egypt is clearly indicated by the fact that the combined acreage of corn, wheat, rice, barley, and grain sorghum amounts to more than 50 percent of the total crop area.

Dry legumes, consisting mainly of horse beans, lentils, fenugreek, chickpeas, and lupines, constitute a rather important food item, supplementary to bread grains. Horse beans are the leading item in this group.

Vegetables are produced abundantly in all seasons. Leading kinds are onions, cucumbers, melons, watermelons, eggplants, tomatoes, lettuce, okra, marrow squash, green peppers, and leeks. Onion exports are an important item. In recent years, potato cultivation has been increasing.

Fruit culture is rather limited. The two major tree fruits are dates and citrus. All the dates produced, which are mostly of inferior quality, are consumed locally. On the other hand, citrus is used more as a cash crop and is beginning to figure in foreign trade. Some figs, grapes, and tropical fruits, such as mangoes and guavas, are produced.

Vegetable oils are an important food and industrial item, with cottonseed being the major source. Other oil seeds are sesame, peanuts, and flaxseed. The people of Egypt depend rather heavily upon these oils to make up for the shortage of animal fats. Before the war, Egypt was able to export annually rather substantial quantities of the seed, oil, and cake of the cottonseed crop. It is likely from now on that the increasing needs of the growing population will gradually absorb the exportable surplus of oil.

The production of sugar from sugarcane is a well-established industry in Egypt. Yields are high, and some 75 percent of the total cane crop is used for sugar production. The balance is used for chewing or the making of syrup.

Berseem (Egyptian clover) is by far Egypt's most important forage crop. It grows luxuriantly and gives from one to four cuttings a year. In addition to being the staple feed of livestock, it fits excellently into the crop rotation and aids in maintaining soil fertility. About 22 percent of the total crop area of Egypt is put under this crop annually.

Livestock numbers are relatively limited. Using land exclusively for pasturing is out of the question. Competition is keen between man and animal for the

products of the soil. In such a situation, it is cheaper to consume crops directly than to transfer them into meat and other animal products.

The water buffalo cow (*gamoosa*) is perhaps the most important animal. It is a hardy draft animal, immune to most pests and diseases, and is a good milk producer. Donkeys and camels are the pack animals and are sometimes used for draft purposes as are cattle. Sheep and goats supplement buffalo and cattle as a source of milk and meat. The production of these two items is much below requirements, and some has to be imported annually. Even then, the annual per capita consumption of dairy products in terms of milk does not exceed 77 to 88 pounds, and that of meat 17.6 pounds.

Government Organization and Policy for Agriculture

Compared with other countries of the Middle East, Egypt presents the most highly organized system of agriculture. The Ministry of Agriculture is one of the most important ministries, staffed with qualified personnel.

For more than two decades, it has carried on extensive research in various fields of agriculture. Outstanding results have been obtained in the development of high-quality cotton and sugarcane, in the improvement of vegetable and fruit culture, in the application of commercial fertilizers, and in the development of superior varieties of wheat, rice, and other grains. Promising projects of livestock improvement are under way (especially that of increasing milk production from the important buffalo cow) as are those of pest and disease control. Extremely efficient work has been done in the selection, inspection, and control of cottonseed. Similar action is now being taken with respect to the seeds of wheat, barley, and other grain crops, and vegetables.

Until recently, extension was largely restricted to directives and control measures. It was and still is very much a one-way relationship, with the Government knowing what is best and telling the *fellah* what to do. A few years ago, a new trend began to develop, based on the principles of extension as a cooperative educational activity between the Government and the farmer. The Ministries of Agriculture, Social Affairs, Health, and others are now cooperating in the realization of a national program of rural welfare.

The development of agricultural cooperatives in the villages is another important activity for which the Egyptian Government has been mainly responsible. Begun in 1908, the movement has grown to include more than 1,500 societies with 150,000 members.

Agricultural education has made a good beginning, although it is still short of the country's needs. Some agricultural instruction has been added to the curriculum of the elementary school. Four intermediate schools of agriculture are in operation. Higher training in various fields is offered at the colleges of agriculture in Cairo and in Alexandria.

In its over-all agricultural policy, Egypt is guided primarily by the interests of the all-important cotton crop. This has been the case for several decades and will continue to be so as long as the present system of land ownership prevails and as long as there is a good foreign market for cotton. The main objective is to get foreign exchange for purchasing industrial products abroad. Some 80 to 90 percent of the total foreign exchange of the country comes from the export of cotton and cotton products.

The outlook for the cotton policy is not yet clear. Some Egyptian economic leaders are inclined to emphasize difficulties of competition and disposal in world markets in the future. Others believe that the

Threshing platforms that ride over the wheat straw and free the grains typify ancient agricultural practices still in use in Egypt.

superior Egyptian cotton will have a good market in a recovered Europe.

In supporting its cotton position, Egypt has embarked upon a supplementary policy of increasing its output of deficit crops and building up an exportable surplus of others. Thus at the outbreak of the war the position was roughly as follows: Self-sufficiency with respect to bread grains, dry legumes, and vegetables; small imports of potatoes, dairy products, and dried fruits; substantial imports of tea and coffee, tobacco, livestock, and commercial fertilizer; small exports of eggs, skins and hides, and wool; substantial exports of cottonseed, cottonseed oil and cottonseed cake, rice, and rock phosphate.

This policy was perforce modified during the war years. Cotton was partly sacrificed for increased food production. With cotton back to near its normal position, where does Egypt stand with respect to surplus and deficit in other crops? We note two major changes in the picture—the appearance of a serious deficit in bread grains, mostly wheat, and a substantial increase in the rice surplus. These changes are the result of a rapidly increasing population and a policy of expanding rice acreage, partly at the expense of wheat. Rice yields are much higher than those of wheat, and, with the abundance of labor, rice can be grown very cheaply. The surplus is now being used profitably in exchange for foreign wheat.

This cannot serve more than a temporary measure. The shortage of grains and of food in general is going to increase as the population continues to increase.

Face to face with this dilemma, the Egyptian Government is now looking seriously into the proposed Aswan Dam project, as mentioned above, with a view to utilizing its hydroelectric energy for the development of industry. It is not yet certain when this project will be realized and to what extent it will help in solving the problem. It seems clear, however, that the Government will continue its present policy of attempting to develop as much as possible the industrial activity of the country. It is hoped that such development will absorb excess farm population and produce goods that are now supplied from imports.

The Fellah, Producer of Egyptian Agriculture

A balanced and realistic appraisal of Egypt's agricultural economy cannot possibly be made without taking into consideration the contribution the cultivator makes and the conditions under which he lives and works.

The *fellah* represents at least 70 percent of the total population of the country. Thus by virtue of sheer numbers, he constitutes a vital national resource. Furthermore, he has been increasing during the past few decades at extremely rapid rates, ranging from 1.5 to 2.0 percent annually. This has resulted in a very high population pressure upon the relatively limited agricultural and industrial resources. Consequently, the *fellah* is now assuming unprecedented national significance in a negative way, so to speak, as the major factor in the most urgent problem facing Egypt.

Largely because of this congested situation, the *fellah's* level of living is one of the lowest in the world. He lives in an extremely crowded village, a conglomeration of mud houses. His dwelling place consists of one or two rooms, housing a family of four to eight persons. Household possessions are few and simple, consisting of a floor mat, a few cooking utensils, two or three mattresses, and a few dishes. Clothing is meager, consisting of one or two garments per person.

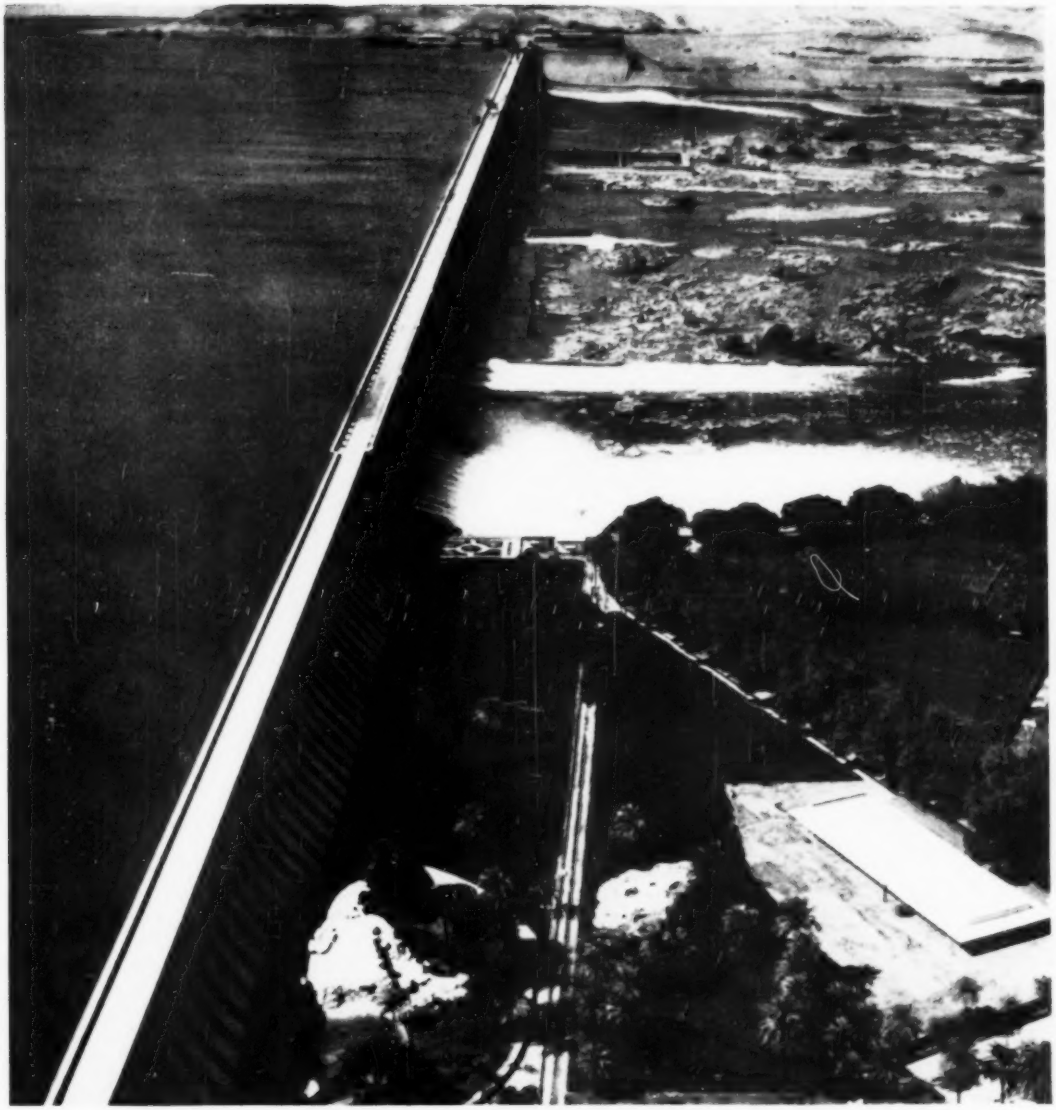
For his nourishment, the *fellah* depends primarily upon cereals. Corn bread is his staple diet. What little additional food he consumes consists mostly of dry legumes, vegetable oil, vegetables, and some fruit in season. He eats little meat, not more than 11 pounds per year. Consumption of dairy products is also low—about 66 pounds per person, in terms of fresh milk. The *fellah's* wife must sell most of her buffalo milk and chicken eggs to buy a few essentials, such as soap, sugar, tea, and coffee.

The better-off family unit with a few acres of land owns a few simple agricultural implements, a buffalo cow or a cow, a donkey, and 10 to 15 chickens. Sometimes there are 1 or 2 sheep or (in Upper Egypt) goats. The most important and most common of these animals are the buffalo cow and the donkey. They are the mainstay of the *fellah's* farm.

In the majority of cases the *fellah* is either the owner of insufficient land or landless. In the first case, he supplements his meager income from his land by hiring himself and members of his family out to owners of large estates or by renting additional land. In the second case, he is a bona fide agricultural laborer. About 73 percent of all landowners have less than an acre of land and 22 percent have 1 to 5 acres. The net income of a typical family unit ranges from $50 to $150 a year. This is, obviously, only bare existence.

The *fellah* is also the victim of disease and a low standard of sanitation, more than the peasant in any neighboring country. Bilharziasis, hookworm disease, and trachoma are widespread. An index of this low health status is afforded by an abnormally high rate of infant mortality, ranging from 15 to 30 percent.

But the *fellah's* life has a brighter and more hopeful



Egypt plans to heighten its great Aswan Dam, important source of irrigation water and hydroelectric power.

side to it. Despite his poverty, low health status, and the meager return he gets from his labor, the *fellah* persists in applying himself diligently to the land. By virtue of his industry and skill, he has made the fertile soil of Egypt produce at its best. He is highly conscious of the fact that he belongs to an integrated community, the village, where other farmers live. He is attached to it both as a cultivator of its land and as a participant in its way of life. He is the possessor of a rich rural culture.

If Egypt succeeds in further developing its incipient industry, if it undertakes seriously to introduce reforms into its land-tenure system, and if it widens the scope of its recent awakening with respect to the significance and welfare of rural life, then the *fellah* will prove to be a greater national resource than he is now.

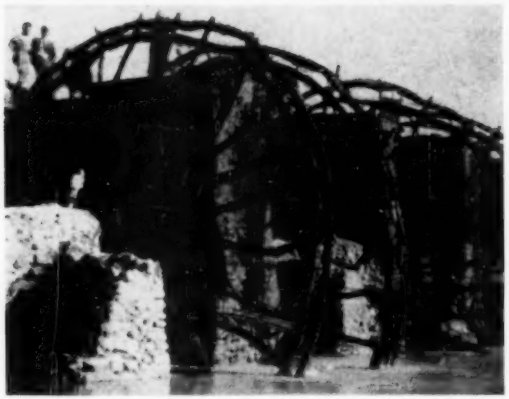
The Middle East Moves Ahead

ISRAEL. Farm tools and equipment are repaired by young farm helpers. Israeli farmers are using modern farm machinery and techniques to develop their agricultural economy. They now have 600 combines, more than 1,500 tractors, and about 400 balers in use in their fields. This is 40 percent of the farm machinery that they expect to get within the next 4 years. In Israel, there are 249 cooperative farms, nearly four-fifths of which are collectives, in addition to 62 farm villages and 42 small-holders settlements.

SYRIA. This is a typical farm scene near Homs. One of the most important recent programs of the Syrian Government is land redistribution under which the landless peasants will get farms of their own.

PALESTINE. This farmland has been terraced to keep the soil from washing away. A mountainous country, Palestine has been fighting erosion with terracing and contour plowing to retain the topsoil.

SAUDI ARABIA. In this land of contrasts, a shepherd halts his flock to watch a tractor prepare land for new farms. The Government is turning barren desert land to productive use through the introduction of modern farming practices. It is the hope that in this way land can be developed for settling nomadic tribes.



IRAQ. Ancient water wheels of Hit and the modern Kut Barrage. The great problem and challenge for Iraq is the modernization of its irrigation system, which could increase agricultural output four or fivefold.

LEBANON. These mountains once supplied cedar for the Temple of Solomon. With forests gone and erosion a constant problem, farmers have for centuries done an outstanding job of terracing to hold the topsoil.

Iran—A Survey of Agriculture*

Modern farming techniques and extensive irrigation could rejuvenate this semiarid country, once the prosperous land of the Persians.

by **GIDEON HADARY**

Agriculture is the principal industry of Iran, providing a livelihood for most of the 16,500,000 [1] inhabitants of the country. Approximately 80 percent of the Iranian population is rural, directly dependent on agriculture for subsistence. A substantial proportion of the urban population also relies on the production and processing of agricultural products for its income.

Factors Affecting Production

Despite Iran's dependence on agriculture, farming in the country is antiquated, and the level of living is extremely low. About 41,000,000 acres—slightly more than 10 percent of the total land area—is classified as cropland, but three-quarters of this cropland is normally in fallow, while only one-quarter of the cropland, or 2.8 percent of the total land, is actually in crops. The area in grains—wheat, barley, rice, and others—is a little more than 8,000,000 acres, and the area planted to all other field crops, including vegetables, melons, fruits, and nuts, is estimated at 3,200,000 acres. Forests and grazing land account for an estimated 69,000,000 acres and wasteland for about 283,000,000 acres—70 percent of the total land area of the country. Since the total area under cultivation and its use varies little from year to year, the data in table 1 may be considered as representative.

Even a superficial study of land utilization in Iran clearly shows that land is not the factor limiting agricultural production and that the area under cultivation could readily be increased. The land classified as potentially cultivable is twice the size of that classified as cropland and is believed to be as fertile as the cultivated land. Scarcity of water is the principal factor preventing the cultivation of this land. Furthermore, with present farming methods, there is only enough manpower and animal power to till the area now under cultivation.

Generally, Iran may be described as a semiarid country. Precipitation varies widely from region to region, ranging from a maximum of 60 inches a year in the Caspian area to a minimum of 2 inches in the south. Precipitation data are only available for recent years. Well-informed Iranian agriculturists state, however, that there is a 7-year precipitation cycle in which there are usually three normal or average years and two abnormal and two subnormal years in the cycle. The production of nonirrigated crops, which account for about 45 percent of the total production of field crops, is said to vary with this precipitation cycle.

An extensive irrigation system to cope with the problem of insufficient water has been developed, the most unique aspect of which is the qanats, or underground channels. Wells at the foot of the hills tap the source from which these gently sloping underground chan-

TABLE 1.—*Estimated land utilization, Iran, 1947*

Major land uses	Area in acres	Percent of total
LAND IN FARMS		
Cropland:		
Grains [1]	8,160,655	2.02
Other field crops [2]	1,519,665	.38
Fruits and nuts	1,680,280	.42
Fallow	29,652,000	7.33
Total	41,018,600	10.15
Pasture	395,360	.10
Farm woodlands	2,471,000	.61
Villages, village roads, wasteland, and other land in farms	3,064,040	.76
TOTAL	46,949,000	11.62
LAND NOT IN FARMS		
Forests and ranges:		
Forests	44,478,000	11.00
Grazing land outside forests	24,710,000	6.11
Total	69,188,000	17.11
Cities, roads, and railroads	4,942,000	1.22
Wasteland:		
Potentially cultivable	81,543,000	20.17
Desert and other wasteland	201,633,600	49.88
Total	283,176,600	70.05
TOTAL	357,306,600	88.38
TOTAL LAND AREAS	404,255,600	100.00

[1] Approximately one-third irrigated.
[2] Approximately 90 percent irrigated.

*See also "Agricultural Production and Food Consumption in Iran," by Afif. I. Tannous, FOREIGN AGRICULTURE, February 1944.

[1] Estimate of population made by the Ministry of Interior in 1939 and 1940.

nels lead the water. At intervals, there are shafts or openings to the surface.

Few modern farming methods are practiced in Iran. Implements are simple and most farmers still cultivate their land as their forefathers did. Ancient wooden and nail plows are pulled mainly by oxen, but also by cows, buffaloes, donkeys, camels, and horses. The resulting furrows are usually shallow and narrow. Threshing is primitive. Grain is winnowed by being thrown into the air. Other practices are equally outdated.

While most western observers believe that the cultivation practices and the implements used in Iran are generally wasteful and inefficient, it must be recognized that in many respects they are extremely suitable to the peculiar conditions of the country. Draft animals are physically unable to draw heavier plows. The introduction of more modern (animal drawn) equipment would first require the improvement of the breed of draft animals and of the feeding practices. The shallow, narrow furrows made by the wooden plow in the treeless plains of Iran prevent wind erosion. More efficient plowing without proper soil protection would probably result in decreased rather than increased production.

Methods of conservation, although primitive, have been carried on by Iranian farmers for many generations. Such practices include terracing and the use of the irrigation qanats, which prevent evaporation and conserve water. Certain trees with religious significance are sanctified and never harmed.

Insofar as pests and diseases are concerned, the most severe are locusts and "sen" or grain bugs (*Eurogaster integriceps*), both primarily attacking the cereal crop. In recent years, Iran has had some success in controlling these.

In addition to the fact that the total area under cultivation in Iran varies little from year to year, the methods and intensity of cultivation remain approximately the same. Thus, the most important factors affecting variations in annual production are (1) the amount and seasonal distribution of precipitation and (2) the extent of pest and disease infestation.

Production and Gross Agricultural Income

In the absence of official agricultural statistics, I have made independent estimates on the production and utilization of products and resources.[2] Only a

[2] The over-all margin of error of the estimates is probably around 30 percent. It is believed that the estimating procedures used cannot in most instances measure production changes that are smaller than the probable margin of error of the estimates. Therefore, it is reasonable to assume that the variations in actual production between 1947 and most other years fall within the margin of error.

Iranian farmers still turn their land with primitive plows pulled by oxen.

Like his forefathers, this farmer winnows his grain by hand.

Threshing implements of early design are generally used.

few of these estimates have been made for prewar or war years. The Iranian agricultural economy is discussed largely in terms of the 1947 crop year (1947-48).

Production

The total volume of agricultural production in Iran in 1947 was roughly 10,700,000 short tons. Animal products accounted for about 2,000,000 tons, slightly less than 20 percent, and all other agricultural products—food and industrial crops and timber from farm woodlots—for about 8,700,000 tons, or 80 percent of the total. An examination of the information appearing in table 2 indicates that Iran is primarily a grain-producing country. Approximately 32 percent of the total volume of the production is grain, and wheat is the most important grain produced. Approximately one-third of the grain is grown in Azerbaijan and Khorassan.

The volume of the production of animal products given in table 2 is based on a livestock population estimated at 24,000,000. The livestock is composed primarily of sheep and lambs, which number about

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TABLE 2.—*Estimated agricultural production and gross agricultural income, Iran, 1947*

PLANT PRODUCTS

Commodity	Production	Gross income
	Short tons	*1,000 Dollars*
Grains:		
Wheat	2,121,900	170,620
Barley	855,400	[1] 15,390
Rice, milled basis	245,800	51,660
Other grains	97,000	[1] 2,565
Total	3,320,100	240,235
Fruits and nuts:		
Fruits, fresh:		
Noncitrus	1,212,500	68,420
Citrus	149,900	14,800
Total	1,362,400	83,220
Fruits, dried:		
Raisins	22,000	4,910
Dates	121,300	9,240
Apricots	4,400	650
Other	44,100	4,350
Total	191,800	19,150
Nuts, unshelled:		
Almonds	21,200	3,560
Walnuts	13,200	1,270
Pistachios	960	810
Other	24,000	2,720
Total	59,360	8,390
Total, fruits and nuts	1,613,560	110,760
Pulses	176,400	20,900
Vegetables, roots, and melons	793,700	18,360
Industrial crops:		
Sugar beets	403,600	6,585
Cotton	19,300	10,260
Tobacco	18,700	13,220
Tea	7,700	870
Oilseeds	63,900	6,850
Opium	330	9,330
Fiber (hemp, jute, and others)	3,300	370
Dyes	2,000	450
Total	518,830	47,935
Timber [2]	2,204,600	24,880
Miscellaneous:		
Condiments	140	930
Gums	6,600	5,550
Other	22,000	6,220
Total	28,740	12,700
TOTAL	8,655,930	475,770

ANIMAL PRODUCTS

Commodity	Production	Gross income
	Short tons	*1,000 Dollars*
Dairy products:		
Milk, fresh	1,686,600	142,750
Butter and butter fat	47,400	56,170
Total	1,734,000	198,920
Meat:		
Mutton and lamb	92,600	36,570
Beef and veal	52,900	13,810
Goat	39,700	10,080
Ham, pork, and other	2,200	1,135
Total	187,400	61,595
Animal fat	23,150	6,530
Total meat and fat	210,550	68,125
Poultry and eggs:		
Poultry, dressed	16,500	7,080
Eggs	39,000	20,640
Total	55,500	27,640

TABLE 2.—*Estimated agricultural production and gross agricultural income, Iran, 1947*—Continued

Wool, hair, skin, and guts:		
Wool	15,000	10,150
Hair	2,800	980
Skin	9,400	6,340
Guts	600	880
Total	27,800	18,350
Other animal products:		
Honey	55	40
Cocoons	1,100	2,800
Other	1,100	310
Total	2,255	3,150
TOTAL	2,030,105	316,185
GRAND TOTAL	10,686,035	791,955

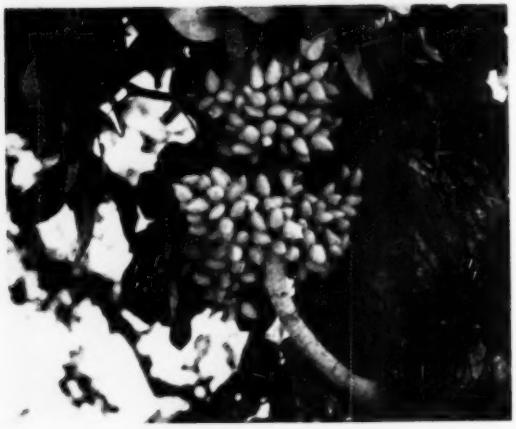
[1] Income only computed for the estimated part of the production utilized as food.
[2] Produced in farm woodlots only.

13,000,000—more than half the total; goats numbering 6,800,000; cattle 2,500,000; asses and horses 1,550,000; mules, camels, and swine totaling 200,000. About half the livestock may be found in the two provinces of Azerbaijan and Khorassan. The sheep of Iran are characterized by the "fat tail." This is their food reservoir, to protect them against the fluctuating feed supply.

Gross Agricultural Income

Many farm families in Iran have no actual cash income. When the value of agricultural commodities

Where livestock have overgrazed land for centuries, erosion is a constant problem.



Pistachio nuts, a delicacy exported by Iran, grow in clusters on a low, wide tree.

consumed on farms is included, however, the income per family per year may be estimated at about 12,000 rials (or $373 at the official rate of exchange) and the gross agricultural income in Iran,[3] at about 25.5 billion rials ($792,000,000). The income from plant products, which accounted for 80 percent of the production, is about 60 percent of the total agricultural income. In contrast, the income from animal products, which only accounted for 20 percent of the volume of production, is estimated at 40 percent of the total value.

Consumption

Agricultural production in Iran is largely devoted to providing food for the country's inhabitants. In the 1947 crop year, it accounted for about three-quarters of the total volume of agricultural production, the remainder consisting of timber produced in farm woodlots, industrial crops, and nonfood livestock products. About 85 percent of the total food production is actually utilized as food, 13 percent is used as seed, wasted, spoiled, or destroyed, while stocks and exports account for the balance—about 2 percent.

[3] Gross agricultural income in Iran has been computed by multiplying the production by the estimated average farm price. In estimating agricultural income, feed and fodder have been excluded since their value is included in the value of the livestock.

The agricultural income estimate is both for tribes and settled farmers. Although it is impossible to segregate the two, it is believed that since the bulk of the livestock is owned by tribes, the income from plant products is almost completely "farm" income, while that from animal products is to a greater extent tribal income.

TABLE 3.—*Estimated supply and distribution of food by major commodity groups, Iran, 1947*

[In short tons]

Item	Food grains [1]	Pulses and vegetables	Fruits and nuts [2]	Sugar and tea	Dairy products	Fats and oils	Meat and fish	Poultry and eggs	Other food	Total
Supply:										
Carry-over, beginning of marketing year	200,905	17,640	40,785	33,200	74,960	2,350	1,100	380	99,980	507,400
Production	2,567,740	970,020	1,873,910	64,880	1,733,920	25,130	212,745	55,560	374,780	7,678,680
Imports	8,820	(3)	(3)	140,580	(3)	20	(3)	(4)	6,060	155,480
Total	2,633,555	987,660	1,914,695	238,660	1,808,880	27,500	213,845	55,950	480,820	8,341,565
Distribution:										
Domestic utilization:										
Food	2,083,350	782,630	1,360,240	162,040	1,622,590	18,465	198,360	52,910	388,670	6,669,250
Other [5]	445,020	176,370	338,405	(3)	111,330	6,610	9,980	2,650	5,510	994,495
Exports	72,750	11,020	197,310	(3)	(3)	(3)	4,405	(4)	(3)	286,870
Stocks, end of marketing year	112,435	17,640	18,740	76,620	74,960	2,425	1,100	390	86,640	390,940
Total	2,633,555	987,660	1,914,695	238,660	1,808,880	27,500	213,845	55,950	480,820	8,341,565

[1] Wheat and rice.
[2] Unshelled nuts.
[3] Negligible.
[4] None.
[5] Including amount used for seed, spoilage, and such.

The average diet in Iran consists mostly of dairy and vegetable products—principally cereals—and little meat. In 1947, the calorie intake per person per day was an estimated 1,988, as compared with around 3,000 in the United States.

The food-extraction rate in Iran is very high. It is estimated that, for all food, net consumption is about 90 percent of the gross weight. Average net annual per capita consumption in 1947 was an estimated 900 grams per day. Vegetable products account for close to 70 percent of the food consumption, and animal products for slightly more than 30 percent.

TABLE 4.—*Estimated average net annual per capita food consumption and energy per person per day, Iran, 1947*

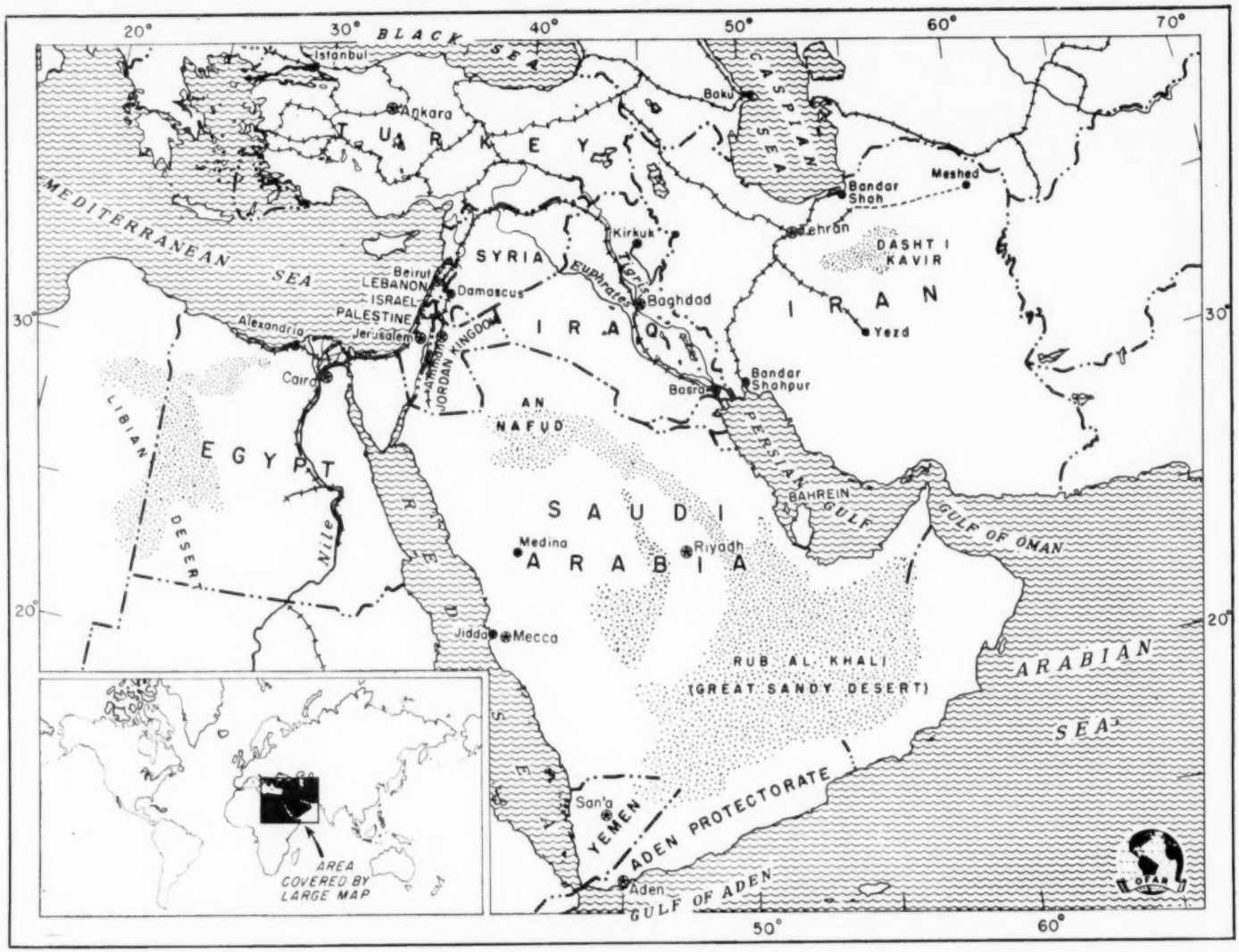
Item	Average net annual per capita consumption as food		Food energy per person per day	
	Amount	Percent of total	Amount	Percent of total
Vegetable products:	*Pounds*		*Calories*	
Food grains	274.4	38.0	1,226	61.7
Pulses and vegetables	86.8	12.1	113	5.7
Fruits and nuts	89.1	12.3	103	5.2
Sugar	18.1	2.5	88	4.4
Other	27.6	3.8	147	7.4
Total	496.0	68.7	1,677	84.4
Animal products:				
Dairy products	196.0	27.1	214	10.8
Meat and fish	21.6	3.0	71	3.6
Poultry and eggs	5.9	.8	9	.4
Animal fats	2.0	.3	15	.7
Other	.7	.1	2	.1
Total	226.2	31.3	311	15.6
TOTAL	722.2	100.0	1,988	100.0

Foreign Trade

Iran is almost completely self-sufficient in the production of all major agricultural items except sugar and tea. In 1947–48, agricultural imports were officially reported to be 155,000 tons, or 43 percent of total imports. Almost 90 percent of these food imports were sugar and tea.

In the same year, agricultural exports, reported to be about 300,000 tons, made up 89 percent of all exports, excluding petroleum and petroleum products, and accounted for more than two-thirds of the total value of all exports. By value, the most important agricultural exports were dried fruits and nuts, gums and resins, opium, vegetable oils, and rice.

The Lar Dam and similar projects will supply water for irrigation and electric power for industry.



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